PTI-223CL

Video Graphic Adapter Card
User's Guide
Version 1.00

Notice

The information in this document is subject to change in order to improve reliability, design, or function without prior notice and does not represent a commitment on the part of this company.

In no event will we be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or the inability to use the product or documentation, even if advised of the possibility of such damages.

No part of this reference manual may be reproduced or transmitted in any form or by any means without the prior written permission of this company.

October 1992, Rev. 3

Trademark Acknowledgments

MultiSync is a trademark of NEC Home Electronics (USA) Inc. Multiscan is a trademark of Sony Corporation of America. Microsoft is a trademark of Microsoft Corporation. AutoCAD, Autoshade, Autosketch, and ADI are trademarks of Autodesk, Inc. TVGA is a trademark of Trident Microsystems, Inc. Ventura Publisher is a trademark of Ventura Software, Inc. Framework is a trademark of Ashton-Tate, Inc. WordStar is a trademark of MicroPro International Corporation. WordPerfect is a trademark of WordPerfect Corporation. IBM, IBM PC, IBM PC/XT, PC/AT, PS/2, and OS/2 are trademarks of International Business Machines Corp. Lotus 1-2-3 is a trademark of Lotus Development Corporation. GEM is a trademark of Digital Research, Inc. P-CAD is a trademark of PC-CAD, Inc. RAMDAC is a trademark of Brooktree Corporation. All other trademarks are of their respective companies.

Limited Warranty

Our company warrants this product against defects in materials and workmanship for a period of one year from the date of purchase. During the warranty period, product determined by us to be defective in form or function will be repaired or at our option, replaced at no charge. This warranty does not apply if the product has been damaged by accident, abuse, misuse, or as a result of service or modification other than by us.

This warranty is in lieu of any other warranty expressed or implied. In no event shall we be held liable for incidental or consequential damages, such as lost revenue or lost business opportunities arising from the purchase of this product.

FEDERAL COMMUNICATIONS COMMISION (FCC) STATEMENT

The FCC ID number of PTI-223CL is KDD-GVD89CLA.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, users and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. How ever, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Shield cables and I/O cards must be used for this equipment to comply with the relevant FCC regulations.

Users are cautioned that changes or modifications not expressly approved in writing by the party responsible for compliance could void the user's authority to operate this equipment.

This digital apparatus does not exceed the Class B Limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communi cation.

Le Présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Class B preescrites dans le règlement sur le brouillage radioélectrique édicté parle Ministère des

Hardware Owner's Manual

Contents

Section 1 — Introduction	1 - 1
Section 2 — Configuring The VGA Graphics Adapter	2 - 1
Section 3 — Installation	3 - 1
Section 4 — Troubleshooting Tips	4 - 1
Appendix	A, B, C, D, E

Introduction

Contents

1.1 Features 1 - 1

1.2 Checklist 1 - 2

1.1 Features

Thank you for purchasing our VGA graphics board. The adapter works with your IBM PC/XT/AT (or compatible) to bring you super-high resolution, 256-color capability, fast screen redraw, and compatibility with most software and hardware.

Compatibility

- 486, 386, 286 and PC compatibles
- Register compatible with Hercules, MDA, CGA, EGA and VGA
- Non-interlaced or interlaced monitor support
- Compatible with Multi-Sync and PS/2 monitors
- 72Hz VESA standard (800x600 resolution)
- 1024x768 70Hz refresh

Resolution And Color Selection

(All modes non-interlaced except where indicated by an "I")

Memory	256K DRAM	512K DRAM	1MB DRAM
640x400	—	256	256
640x480	16	16, 256	16, 256, 32K*, 16M
768x1024	—	16-I	16-I
800x600	16	16, 256-I	16, 256, 32K*
1024x768	—	16-I/NI	16-I/NI, 256-I/NI

*Same DRAM requirement for 64K colors

Extended Text Display

- 80-column text modes in 30, 43, and 60 rows
- 132-column text modes in 25, 30, 43 and 60 rows

Software Drivers Supported

- AutoCAD
- Autoshade
- CADKEY
- Framework
- GEM Desktop
- Lotus
- MS Windows
- MS Word
- P-CAD
- Symphony
- Ventura
- VersaCAD
- WordPerfect
- WordStar
- OS/2 Presentation Manager
- Quattro Pro
- VESA BIOS Extension

1.2 Check List

In addition to this manual, you should have the following:

√ VGA Graphics Adapter
√ One Driver & Utility Diskette

If any of these items are missing or damaged, contact your dealer.

Take this time to record the following information:

Dealer:
Date of Purchase:
Invoice Number:
Dealer's Phone:

IMPORTANT: Keep all packaging materials that accompany your adapter in the event you need to return the product.

1.3 Technical Support

In the event you have a technical problem, please contact your dealer for support.

Configuring Your VGA Adapter

Contents

2.1 Hardware Configuration	**2 - 2**
2.2 Jumper Settings	**2 - 2**
2.2.1 Enable/Disable Zero-Wait State: Jumper J1 and J2	2 - 2
2.2.2 Scan Rate Select : Jumper J7	2 - 3
2.2.3 Enable/Disable Autodetect: Jumper J8	2 - 4
2.2.4 ISA Bus Slot Select: Jumper J6, J9 and J10	2 - 5

This section explains how to configure the adapter for use with your computer system.

WARNING: Incorrect setting or use of the adapter may result in damage to the computer system, monitor, or the graphics adapter itself. Carefully read through this manual before installing the adapter in your system. Step-by-step instructions in the "Installation" section will guide you through the installation process.

2.1 Hardware Configuration

Figure 1 is a diagram of the VGA graphics adapters. Board features are listed.

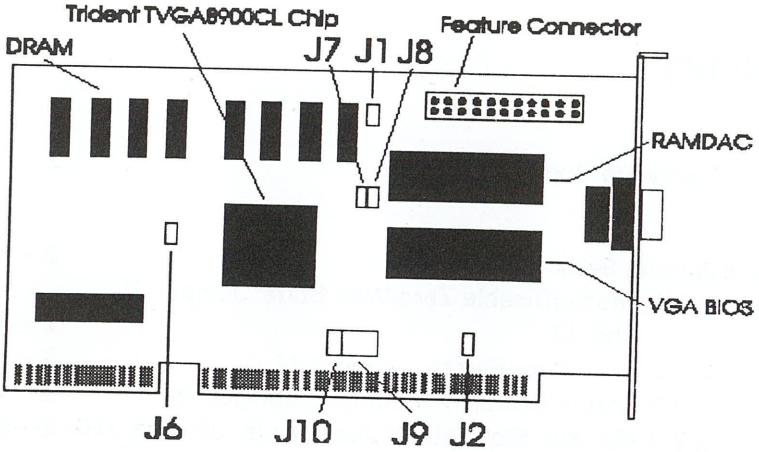


FIGURE 1. 256k-512k-1.0MB Jumpers & Component Locations

2.2 Jumper Settings

You can adapt the VGA adapter for special hardware configurations using the given jumpers on the card.

2.2.1 Enable/Disable Zero-Wait State

J1 and J2 allows you to enable/disable the adapter's ISA bus zero-wait state feature. When enabled (default), the CPU can transfer data to the VGA adapter at the zero-wait state rate through ISA bus. There are two zero-wait state stages that can be enabled or disabled. If your display exhibits pixel drop outs or the system hangs, use Jumper J2 to disable the first zero-wait state stage. If you still encounter problems, use Jumper J1 to disable the second zero-wait state stage. Figures 2-A and 2-B show how to enable/ disable the zero-wait state stages.

FIGURE 2-A. J2 Enable/Disable First Stage Zero-Wait State

J2: Enable First Stage Zero-Wait State
(Default: Pin 1 and 2 connected)

J2: Disable First Stage Zero-Wait State
(Pin 1 and 2 open)

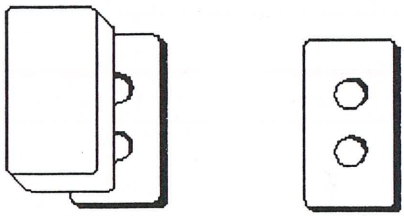
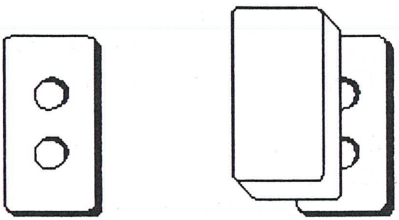


FIGURE 2-B. J1 Enable/Disable Second Stage Zero-Wait State

J1: Enable Second Stage Zero-Wait State
(Default: Pin 1 and 2 open)

J1:Disable Second Stage Zero-Wait State
(Pin 1 and 2 conneted)



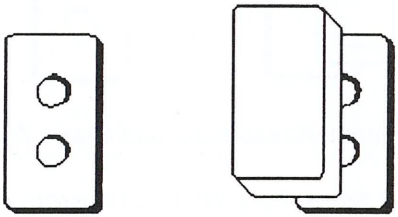
2.2.2 Select Scan Rate: J7

J7 allows you to configure the scan rates of extended VGA modes to be compatible with your multi-scanning monitor. **J7 is operational for 4 DRAM (512K) and 8 DRAM (1 MB) configurations only.** If your monitor can scan at 48.7 KHz, remove the Jumper pin across J7 . J7 in the open position will allow non-interlaced display for 1024x768 modes and higher horizontal and vertical scan rates for 800x600-16 color (4 DRAM and 8 DRAM) and 800x600-256 (8 DRAM only). If your monitor cannot

scan at 48.7KHz, leave the Jumper pin for J7 in the default position. This will give interlaced display for 1024x768 modes and reduced horizontal and vertical scan rates for the 800x600-16 color (4 DRAM and 8 DRAM) and 800x600-256 (8 DRAM). Reference Table 1 (page 3-4), Table 4 (Appendix A-4), and your monitor specifications for more detail on scan rates. Figure 3 illustrates the two settings for Jumper J7.

FIGURE 3. J7 Setting for Selecting Scan Rate

J7: 48.7 KHz Scan Rate (Pin 1 and 2 open) **J7: Default Scan Rate (Pin 1 and 2 connected)**



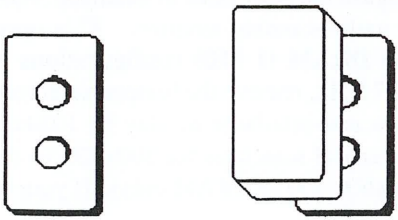
2.2.3 Enable/Disable Autodetect: J8

J8 allows you to enable/disable the BIOS Autodetect feature. When enabled (default) the BIOS will determine whether the Graphics Adapter can operate with an 8-bit or 16-bit BIOS interface, and will configure the BIOS interface accordingly. When disabled, the board will boot up in its default BIOS interface setting (generally 8-bit).

NOTE: If you have problems booting your system, set Jumper J8 to disable autodetect, or place the card in an 8-bit slot and set J6, J9 and J10 jumpers according to Figure 5-B.

FIGURE 4. J8 Settings to Enable/Disalbe Autodetect

J8: Enable Autodetect **J8: Disable Autodetect**



2.2.4 8- or 16-Bit ISA Bus Slot Select

J6, J9 and J10 are used to select whether the VGA adapter is seated in a 8-bit or 16-bit slot.

FIGURE5-A. J6, J9 and J10 setting for 16-bit slot

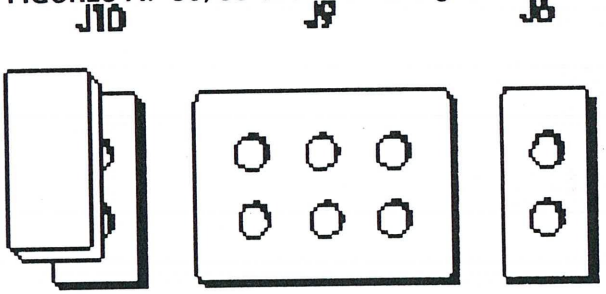
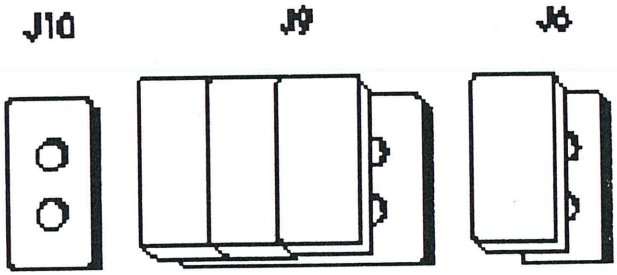


FIGURE 5-B. J6, J9 and J10 setting for 8 bit slot



Installation

Contents

3.1 Installation Procedures 3 - 2

3.2 Connecting the Monitor 3 - 3

3.2.1 Monitor Support for Enhanced VGA Modes 3 - 3

3.3 Advanced Topics 3 - 5

The installation procedure for your VGA graphics adapter will vary slightly depending on the type of system you have (i.e. an IBM PC/XT/AT or compatible). Just follow the general installation instructions in this section, and look for any special steps you will need to take for your particular system.

3.1 Installation Procedures

To install the adapter into your system, follow these steps:

1. **Turn OFF all power to your system, including any peripherals** (printer, external drives, modem, etc.).

2. **Unfasten the cover mounting screws on your system.** Reference your system user manual to determine the location of the mounting screws.

3. **Remove the system cover.** Reference your system user manual for instructions on how to remove the system cover.

4. **If you have an IBM PC or PC/XT:** You may need to manually configure the motherboard for the graphics card type. Reference your system user manual for instructions on how to configure the system.

   If you have an IBM AT or compatible system: You don't need to reset any DIP switches in your system, since AT computers and compatible systems use the SETUP file instead of DIP switches to tell the computer what equipment is stored in your system. Just continue on to Step 5.

5. **Select an open expansion slot.** Select an appropriate expansion slot for the adapter. Any available 8-bit slot in a PC/XT/AT or compatible, or 16-bit slot in a PC/AT or compatible will do. If you install in a 8-bit slot, please set up the jumpers according to Figure 5-B. Remove the retaining screw that holds the slot cover in place. Slide the slot cover out and put the screw aside (you will need it to secure the adapter).

6. **Install the adapter.** To install the adapter in the selected expansion slot, place the gold-fingered edge-connector of the adapter directly above an expansion slot on the motherboard. Gently push theVGA adapter down until it snaps into place. Make sure it is securely seated in the expansion slot.

7. **Attach the adapter.** Use the screw you removed from the expansion slot in Step 5 to secure the adapter in place.

8. **Replace the computer's cover.** Secure the cover with the mount-ing screws you removed in Step 2.

You have now completed the installation of your new graphics adapter on your system. Before you use the system, however, please refer to Section 3.2, Connecting the Monitor.

3.2 Connecting the Monitor

The adapter offers a 15-pin analog connector. When you connect your monitor to the adapter, be sure you have the right cable and cable connector. Fixed-frequency analog monitors come equipped with a 15-pin connector. Variable frequency analog or analog/digital monitors will require a 9-to-15-pin cable connector.

3.2.1 Monitor Support for Enhanced VGA Modes

Your monitor must be capable of displaying the mode you choose. Table 1 lists all available VGA display modes for the adapter, the monitors which support them, plus other information that may be useful.

Note that the color palette, i.e., the total number of possible colors to choose from, is 262,144 in all modes except for monochrome modes where the color palette is 2—black and the monitor phosphor color. For example, in mode 62 (1024x768-256 colors), the total colors available for display on the monitor at one time is 256 different colors from a palette of 262,144.

If your VGA card is equipped with a 16-bit or 24-bit RAMDAC, the total colors available for display on the monitor at one time is 32K/64K or 16M colors. Please check with your dealer to determine whether your VGA is equipped with a 16-bit or 24-bit RAMDAC.

TABLE 1. Display Modes

Mode (hex)	Type Format	Alpha Format	Resolution/ Colors	8514[1]	Fixed	Multisync[2] Freq.	Buffer Start	Char Size
0,1	text	40x25	320x200-16	Yes	Yes	Yes	B8000	8x8
2,3	text	80x25	640x200-16	Yes	Yes	Yes	B8000	8x8
0 [3],1 [3]	text	40x25	320x350-16	Yes	Yes	Yes	B8000	8x14
2 [3],3 [3]	text	80x25	640x350-16	Yes	Yes	Yes	B8000	8x14
0 [4],1 [4]	text	40x25	360x400-16	Yes	Yes	Yes	B8000	9x16
2 [4],3 [4]	text	80x25	720x400-16	Yes	Yes	Yes	B8000	9x16
4,5	graphics	40x25	320x200-4	Yes	Yes	Yes	B8000	8x8
6	graphics	80x25	640x200-2	Yes	Yes	Yes	B8000	8x8
7 [3]	text	80x25	720x350-mono	Yes	Yes	Yes	B0000	9x14
7 [4]	text	80x25	720x400-mono	Yes	Yes	Yes	B0000	9x16
D	graphics	40x25	320x200-16	Yes	Yes	Yes	A0000	8x8
E	graphics	80x25	640x200-16	Yes	Yes	Yes	A0000	8x8
F	graphics	80x25	640x350-mono	Yes	Yes	Yes	A0000	8x14
10	graphics	80x25	640x350-16	Yes	Yes	Yes	A0000	8x14
11	graphics	80x30	640x480-2	Yes	Yes	Yes	A0000	8x16
12	graphics	80x30	640x480-16	Yes	Yes	Yes	A0000	8x16
13	graphics	40x25	320x200-256	Yes	Yes	Yes	A0000	8x8
50	text	80x30	640x480-16	Yes	Yes	Yes	B8000	8x16
51	text	80x43	640x473-16	Yes	Yes	Yes	B8000	8x11
52	text	80x60	640x480-16	Yes	Yes	Yes	B8000	8x8
53	text	132x25	1056x350-16	Yes	Yes	Yes	B8000	8x14
54	text	132x30	1056x480-16	Yes	Yes	Yes	B8000	8x16
55	text	132x43	1056x473-16	Yes	Yes	Yes	B8000	8x11
56	text	132x60	1056x480-16	Yes	Yes	Yes	B8000	8x8
57	text	132x25	1188x350-16	Yes	No	Yes	B8000	9x14
58	text	132x30	1188x480-16	Yes	No	Yes	B8000	9x16
59	text	132x43	1188x473-16	Yes	No	Yes	B8000	9x11
5A	text	132x60	1188x480-16	Yes	No	Yes	B8000	9x8
5B [8]	graphics	100x75	800x600-16	Yes	No	Yes	A0000	8x8
5B [7]	graphics	100x75	800x600-16	No	No	Yes	A0000	8x8
5C [7]	graphics	80x25	640x400-256	Yes	Yes	Yes	A0000	8x16
5D [7]	graphics	80x30	640x480-256	Yes	Yes	Yes	A0000	8x16
5E [10,12]	graphics	100x75	800x600-256	No	No	Yes[9]	A0000	8x8
5E [8,11]	graphics	100x75	800x600-256	Yes	No	Yes	A0000	8x8
5E [8,11]	graphics	100x75	800x600-256	No	No	Yes	A0000	8x8
5F [7,10]	graphics	128x48	1024x768-16	Yes	No	Yes	A0000	8x16
5F [7,11]	graphics	128x48	1024x768-16	No	No	Yes[5]	A0000	8x16
60 [10]	graphics	128x48	1024x768-4	Yes	No	Yes	A0000	8x16
61 [6,7]	graphics	96x64	768x1024-16	No	No	Yes[6]	A0000	8x16
62 [8,10]	graphics	128x48	1024x768-256	Yes	No	Yes	A0000	8x16
62 [8,11]	graphics	128x48	1024x768-256	No	No	Yes[5]	A0000	8x16

TABLE 1. Display Modes - continued

Mode (hex)	Type Format	Alpha Format	Resolution/ Colors	8514[1]	Fixed	Multisync[2] Freq.	Buffer Start	Char Size
6C [8,13]	graphics	80x30	640x480-16M	Yes	Yes	Yes	A0000	8x16
74/75[8,14]	graphics	80x30	640x480-32/64K	Yes	Yes	Yes	A0000	8x16
76/77[8,14]	graphics	100x75	800x600-32/64K	No	No	Yes[5]	A0000	8x8

Table Notes:

[1] 8514 is an IBM PS/2 monitor.

[2] Multisync monitors support both Analog and TTL operations (e.g. NEC Multisync 3D).

[3] EGA text modes with 8x14 and 9x14 character sizes and 350 lines vertical resolution.

[4] VGA text modes with 9x16 character size and 400 lines vertical resolution.

[5] Check to see if your multisync monitor supports the interlaced or non-interlaced versions of these modes (monitor must support horizontal scan rate of 48.7 KHz or 56.4 Khz for non-interlaced display).

[6] A portrait monitor is required to run this mode (e.g. Magics -15FP).

[7] Supported by 4 and 8 DRAM configurations only.

[8] Supported by 8 DRAM configuration only.

[9] Not every multisync monitor works (e.g., NEC 3D does not support low frequency).

[10] Interlaced mode.

[11] Non-interlaced mode.

[12] Supported by 4 DRAM configuration only.

[13] 24-bit color RAMDAC required.

[14] 16-bit RAMDAC required.

Note: You may need to adjust your multi-frequency monitor to display these modes properly. Use the horizontal and vertical size and position controls on your monitor to display without distortion.

3.3 Advanced Topics

The VGA card supports a variety of video modes (standard VGA and hi-resolution) which are accessible through a video BIOS call from assembly language or other higher-level programming languages. Reference Appendix C for sources of programming assistance.

When you start up in DOS, the screen display defaults to the standard 80 column text or alpha-numeric mode. This is mode 3^4 on a color system, or mode 7^4 on a monochrome VGA system (see footnote references in **Table Notes** section above).

Troubleshooting Tips

Contents

4.1 Hardware Troubleshooting	4 - 1
4.2 Commonly Asked Questions	4 - 2
4.2.1 Monitors	4 - 2
4.2.2 Systems	4 - 3
4.2.3 Software Applications	4 - 3
4.3 Troubleshooting MS-Windows	4 - 4
4.3.1 Troubleshooting Windows 3.0 and 3.1	4 - 4
4.3.2 Troubleshooting Windows 3.1	4 - 7

4.1 Hardware Troubleshooting

The following are some recommended steps to take if the VGA Graphics Adapter will not boot or operate properly in your system:

1. Check to see if the card is firmly seated in its bus expansion slot. Be sure it is not making contact with any other cards in the system.
2. Be sure your monitor is properly connected to the card. Be sure your monitor's pin definitions match those of your VGA Graphics card.
3. Be sure your system's power supply is operating properly (i.e. fan operates, system power light comes on).
4. If the VGA adaptor is seated on a IBM PC/XT slot or an 8-bit AT slot, be sure J6, J9 and J10 jumpers are connected. (See section 2, Configuring Your VGA Adapter)
5. If you are using an IBM PC/XT or compatible, check to see your system BIOS is dated October 27, 1982 or later. System BIOS versions prior to this date will not support the adapter card.

Special Configuration Requirements for EMS Cards, LAN Cards, and SCSI, ESDI, or RLL Controllers

1. EMS Card: be sure the EMS pages do not conflict with the video RAM space (A0000-DFFFF). If you cannot move the EMS pages out of the A0000-DFFFF area, move Jumper J8 to the Disable Autodetect position.

2. LAN Card: If you encounter problems with network products, move Jumper J8 to the Disable Autodetect position.

3. SCSI, ESDI, or RLL Controller: If you encounter problems, move Jumper J8 to the Disable Autodetect position.

Note: See section 2, Configuring Your VGA Adapter for information on Jumper J8

4.2 Commonly Asked Questions

4.2.1 Monitors

Q. Why does the display shift or change sizes when I switch modes?

A. Some monitors lack auto-sizing features or just do not synchronize properly to the video board output. In some cases, horizontal and vertical display adjustments may be necessary.

Q. What kind of monitor do I need to display 800x600 or 1024x768 resolution?

A. To display 800x600 resolution at 56Hz refresh, your monitor must be capable of a 35.2KHz horizontal scan rate (e.g., NEC 2A, 3D). At 72Hz refresh, your monitor must be capable of a 48.0KHz scan rate (e.g., Sony HG 1304, NEC 4D, 5D, Seiko 1450.)

To display 1024x768 interlaced, your monitor must be capable of a 35.5KHz horizontal scan rate (e.g., NEC 3D, Seiko 1430 or 1440). To display 1024x768 non-interlaced, your monitor must be capable of a 48.7KHz scan rate (e.g., Sony HG 1304, NEC 4D, 5D, Seiko 1450).

4.2.2 Systems

Q. Can I have two graphics boards in my system at the same time?

A. A monochrome card may co-reside with the VGA adapter. You cannot have an EGA, CGA, or another VGA card co-resident.

Q. I see "mouse droppings" on the screen when I move my mouse around. Is this a problem with my mouse?

A. Could be. The version of your mouse driver may not support VGA. Another possibility is that the DRAM on your card is not seated correctly or is not the right speed. If you have added your own DRAM to the card, make sure it is 80 nanosecond Fast Page Mode DRAM.

4.2.3 Software Applications

Q. When I run a system utilities program (PC Tools, Norton Utilities, etc.) it tells me I only have 256K of video memory, even though 512K or 1MB is on the board. What's wrong?

A. Nothing is wrong. System utility programs are designed to detect only the IBM VGA Standard amount of video memory (256K).

Q. My display is not correct when I run VPIC or RIX. What's wrong?

A. The first thing to check is the software version. VPIC should be version 4.6 or later. RIX must be version 1.38 or later. If using an earlier version of VPIC, please contact your software vendors for upgrade information.

Q. My display is not correct when I run the Print Preview function for WordPerfect 5.1, File Import/Export function of Applause 1.5, or IBM 3270 Emulation version 2. What's wrong?

A. Try using the utility program called TPATCH. TPATCH provides several patch files to correct screen display problems. You can use TPATCH to correct the display problems in WordPerfect 5.1, Applause 1.5, IBM 3270 Emulation, and others. Please refer to the Software Owner's Manual for details.

4.3 Troubleshooting MS-Windows

4.3.1 Troubleshooting Windows 3.0 and 3.1

This section provides troubleshooting tips for users having problems installing or using the high resolution drivers provided for Windows 3.0 and 3.1. Be sure you have installed the TVGACRTC and SVM utilities on your hard drive before you continue with the troubleshooting procedures.

NOTE: "Delete driver files" means delete "VDDTVGA.386", "T640C.DRV", and "T1024FC.DRV" etc. in C:\WINDOWS\SYSTEM directory and "OEMSETUP.INF" in C:\WINDOWS directory.

Problem: Windows screen won't come up. It kicks back to DOS prompt.

Solution:

a. Be sure the driver version is the correct one for the Trident chipset on your card (e.g. T1024FC.DRV for TVGA9000 and 8900CL). Be sure the resolution chosen is a match for the amount of memory on-board. (Please refer to REAME.TXT file in WIN subdirectory of your Utility Disk and table on page 1-1 for detail memory requirement.)

b. Try adding the statement "EMMEXCLUDE=A000-C7FF" to the [386 enhanced] section of the Windows SYSTEM.INI file. The SYSTEM.INI file is located in the WINDOWS\SYSTEM directory.

c. If using QEMM, try adding QEMM exclude statement "DEVICE=QEMM386.SYS X=A000-C7FF" to your CONFIG.SYS file.

d. Check CONFIG.SYS and AUTOEXEC.BAT files and minimize TSRs (Terminate and Stay Resident Programs) or Device Drivers, such as, DEVICE=TVGABIO.SYS in CONFIG.SYS or PCSHELL.EXE in AUTOEXEC.BAT.

e. Delete and reinstall the driver(s).

Problem: Windows hangs up during or after installing a driver.

Solution:

a. Reread installation procedures to be sure you have installed the drivers correctly.

b. Did Windows display an error message before hang-up?

If no:

Check CONFIG.SYS and AUTOEXEC.BAT files and minimize TSRs (Terminate and Stay Resident Programs) or Device Drivers, such as, DEVICE=MOUSE.SYS in CONFIG.SYS or PCTOOLS.EXE in AUTOEXEC.BAT.

If SYSTEM.INI (located in the WINDOWS\SYSTEM directory) has been edited, try replacing with a clean version from the original Windows diskettes.

Delete and reinstall the driver(s).

If yes:

If Windows reports "... file corrupted", delete Trident driver files and use a new set of drivers.

If installing on a network via "SETUP/N", you will need to use the "EXPAND" utility (located on original Windows diskettes) to expand the display drivers.

If installing on a network and Windows reports "error building WIN.COM", you will need to upgrade to Windows version 3.00a.

Problem: Garbage on the screen or double images.

Solution:

a. Use View Option (F5) in SVM program to verify the problem.

b. Check jumper J7. Be sure the jumper setting is correct for your monitor.

c. Defective board. Contact your dealer.

Problem: Windows color palette does not look right or colors changing.

Solution:

Most likely a defective RAMDAC, memory chip, clock chip, or crystal. Contact your dealer to have the problem taken care of.

Problem: Can't display certain modes.

Solution:

a. Run SVM program. If SVM fails:

b. Check to see you have enough memory on the VGA card to run this mode.

c. Run TVGACRTC program to adjust video parameters.

d. Hardware problem, check spec. and capability of the monitor.

Problem: Windows screen size is too tall or too narrow.

Solution:

a. Run SVM to verify the problem.

b. Use TVGACRTC to adjust screen size.

Problem: Icons and characters are too small in 1024x768 mode.

Solution: Try using the 1024x768 Large Font Driver.

Problem: Mouse doesn't function properly.

Solution:

a. Check mouse connection.

b. Contact mouse vendor for latest version of the mouse driver.

4.3.2 Troubleshooting Windows 3.1

This section provides troubleshooting tips for users having problems installing or using the high resolution drivers for Windows 3.1 only.

Problem: When changing resolutions by running SETUP, the SETUP menu displays more than one selection for the same resolution mode.

Solution: When upgrading to a new set of Windows drivers, you need to delete the old OEM?.INF(e.g. OEM0.INF) file in the WINDOWS\SYSTEM subdirectory. The SETUP menu will then display only one selection for each resolution mode.

Appendix

Contents

Appendix A: Pinout and Sync Frequencies	**A - 1**
A1.1 Analog Color Display Pinouts	A - 1
A1.2 Conversion Table: 9-to-15 Pin	A - 2
A1.3 Video Signals	A - 3
A1.4 Sync and Polarity Specifications	A - 3
Appendix B: DRAM Upgrades	**B - 1**
Appendix C: Additional Sources for Programming Assistance	**C - 1**

Appendix A
Pinout and Sync Frequencies

A1.1 Analog Color Display Pinouts

Table 2 shows the VGA Graphics Adapter analog color display pinouts.

TABLE 2. Analog Color Display Pinouts

Pin	Function
1	Red Video[1]
2	Green Video[1]
3	Blue Video[1]
4	Not Used
5	Ground
6	Red Return (ground)
7	Green Return (ground)
8	Blue Return (ground)
9	Key (no pin)
10	Sync Return (ground)
11	Monitor ID (not used)
12	Monitor ID[2]
13	Horizontal Sync
14	Vertical Sync
15	Not Used

[1] Analog monochrome-type monitors use green video for all video input and ignore red video and blue video.

[2] Monochrome monitors connect Pin 12 to ground. Color monitors leave Pin 12 open. The adapter uses Pin 12 to detect the monitor type.

A1.2 Conversion Table: 9-to-15 Pin

If you will be using a 9-to-15-pin adapter cable to link your 9-pin monitor connector to the 15-pin connector, check Table 3 carefully before you install the cable. 9-to-15 pin adapter cables are available from a variety of sources, but they need to match the specifications in Table 3 in order to work properly with your new adapter.

The adapter requires a D-shaped 9-pin female connector and a D-shaped 15-pin male connector.

TABLE 3. 9-to-15 Pin Conversion Table

9-Pin Connector Signal	Pin	15-Pin Connector Signal	Pin
Red	1	Red	1
Green	2	Green	2
Blue	3	Blue	3
Horz Sync	4	Horz Sync	13
Vert Sync	5	Vert Sync	14
Red Ground	6	Return Red	6
Green Ground	7	Return Green	7
Blue Ground	8	Return Blue	8
Sync Ground	9	Digital Ground	10
		Ground	5

A1.3 Video Signals

Analog:

Black Level = 0V

Full Intensity Level = +0.7V

A1.4 Sync and Polarity Specifications

Table 4 lists the horizontal sync, vertical sync, and polarity for all available VGA modes. If you are not sure if your monitor will support a particular mode, check your monitor's specification for horizontal sync, vertical sync, and polarity against these tables.

TABLE 4. Sync and Polarity Specifications

Mode (h)	Clock (MHz)	Horz Sync (KHz)	Vert Sync (Hz)	Polarity (H, V)
0,1	25.175	31.4	70	+, -
2,3	25.175	31.4	70	+, -
0[1],1[1]	25.175	31.4	70	-, +
2[1],3[1]	25.175	31.4	70	-, +
0[2],1[2]	28.322	31.5	70	+, -
2[2],3[2]	28.322	31.5	70	+, -
4,5	25.175	31.4	70	+, -
6	25.175	31.4	70	+, -
7	28.322	31.5	70	+, +
7+	28.322	31.5	70	+, +
D	25.175	31.4	70	+, -
E	25.175	31.4	70	+, -
F	25.175	31.4	70	-, +
10	25.175	31.4	70	-, +
11	25.175	31.4	60	-, -
12	25.175	31.4	60	-, -
13	25.175	31.4	70	+, -
50	25.175	31.5	60	-, -
51	25.175	31.5	60	-, -
52	25.175	31.5	60	-, -
53	40.000	31.2	70	-, +
54	40.000	31.2	60	-, -
55	40.000	31.2	60	-, -
56	40.000	31.2	60	-, -
57	44.900	31.2	70	-, +
58	44.900	31.2	60	-, -
59	44.900	31.2	60	-, -
5A	44.900	31.2	60	-, -
5B[8]	36.000	35.2	56	-, -
5B[3,9,10]	50.350	48.0	72	+, +
5C[3]	50.350	31.5	70	-, +
5C[4]	25.175	31.5	70	-, +
5D[3]	50.350	31.5	60	-, -
5D[4]	25.175	31.5	60	-, -
5E[5,7]	57.272	29.5	90	+, +
5E[4,6,8]	36.000	35.2	56	-, -
5E[4,6,9]	50.350	48.0	72	+, +
5F[4,5,8]	44.900	35.5	86	+, +
5F[4,6,9,10]	65.000	48.7	60	+, +
5F[4,6,9,12]	75.000	56.4	70	+, +
60[5]	44.900	35.5	86	+, +
61[11]	44.900	37.9	70	+, +

TABLE 4. Sync and Polarity Specifications - Continued

Mode (h)	Clock (MHz)	Horz Sync (KHz)	Vert Sync (Hz)	Polarity (H, V)
62[4,5,8]	44.900	35.5	86	+, +
62[4,6,9,10]	65.000	48.7	60	+, +
62[4,6,9,12]	75.000	56.4	70	+, +
6C[4,6,13]	75.000	31.4	60	-, -
74/75[4,6,14]	50.350	31.4	60	-, -
76/77[4,6,14]	72.000	35.2	56	-, -

Table Notes:

[1] EGA text modes with 8x14 and 9x14 character sizes and 350 lines vertical resolution.

[2] VGA text modes with 9x16 character size and 400 lines vertical resolution.

[3] Supported by 4 and 8 DRAM configurations only.

[4] Supported by 8 DRAM configuration only.

[5] Interlaced mode.

[6] Non-interlaced mode.

[7] Supported by 4-DRAM configuration only.

[8] Jumper J7 connected.

[9] Jumper J7 open.

[10] High refresh monitor required with horizontal frequency greater than 48KHz.

[11] Portrait monitor.

[12] High refresh monitor required with horizontal frequency greater than 56 KHz.

[13] 24-bit color RAMDAC required.

[14] 16-bit RAMDAC required.

Appendix B
DRAM Upgrades

The VGA adapter can be configured with two, four or eight pieces of 256Kx4 (80 nanosecond) Fast Page Mode DRAM.

Upgrading from two to four DRAM allows you to display up to 1024x768-16 colors. Upgrading from four to eight DRAM allows you to display up to 1024x768-256 colors. It also speeds up the performance. To purchase DRAM, contact your dealer, a local electronics store, or a mail order house (which advertise in publications such as *Computer Shopper, PC Magazine, PC World, and BYTE*). Order 256Kx4 Fast Page Mode DRAM (sometimes called one megabit DRAM). DRAM speed should be 80 nanoseconds.

Upgrading From 256KDRAM to 512K or 1MB

1. Place the adapter component side up on a firm, flat, non-static surface (avoid wool materials). The gold edge connector should be facing you.

2. Insert the DRAM (two pieces if upgrading to 512K and 6 pieces if upgrading to 1 MB) into the sockets provided on the upper left-hand corner of the board. DRAM should be added in columns according to the diagrams on the next page (Figure B-1). The notched side of the DRAM should be facing down. Be careful not to bend the pins. Be sure each DRAM is seated snugly.

3. To check that the DRAM has been installed properly, place the board in your system and turn the system ON. A copyright and the amount of video DRAM detected will appear in the upper left-hand corner of the initial boot screen. If the amount of DRAM detected is the same as the amount installed (512K or 1MB), you have installed the DRAM successfully. If the amount of DRAM detected is 256K, remove the adapter from your system. Check to see that all pins fit snugly into their respective socket holes (i.e., no pins bent underneath the DRAM chip or sticking out). Be sure the notches for each DRAM are facing the same way.

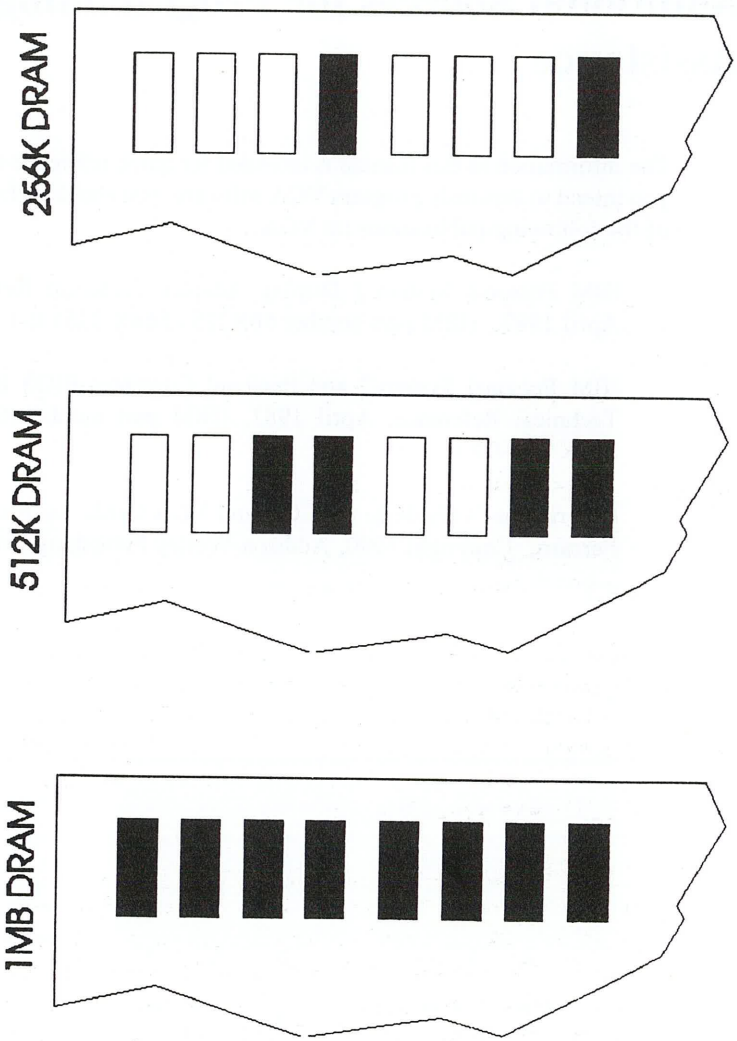


Figure B-1. DRAM Upgrade

Appendix C
Additional Sources for Programming Assistance

The information in this manual is intended for quick reference only. If you intend to seriously program VGA software, you should refer to one of the following publications on VGA:

IBM Personal System/2 Display Adapter Technical Reference, April 1987. (IBM part number 68X2251 S68X-2251-0.)

IBM Personal System/2 and Personal Computer BIOS Interface Technical Reference, April 1987. (IBM part number 68x2260 S68X-260-00.)

Programmer's Guide to the EGA and VGA Cards, by Richard F. Ferraro. Copyright 1990, Addison-Wesley Publishing Company.

Software Owner's Manual Contents

1. Overview 3

2. Utilities Installation 5
   2.1 Installation Procedures 5
   2.2 Utilities Summary 6
      2.2.1 SVM.EXE 6
         2.2.1.1 How to use SVM 7
         2.2.1.2 Example: Switching to EGA Mode with SVM 8
      2.2.2 VESA 9
      2.2.3 BIC 9
      2.2.4 SMONITOR 9
      2.2.5 TVGABIO 9
      2.2.6 TANSI.SYS 10
      2.2.7 TVGACRTC 10
      2.2.8 LCDC 10
      2.2.9 TPATCH 11

3. Driver Installation 12
   3.1 AutoCAD, Autoshade 13
      3.1.1 AutoCAD Release 9 and 10 (ADI Driver) 13
         3.1.1.1 Autoshade 1.1 15
      3.1.2 AutoCAD/386 Release 10 and 11 (PDI Driver) 15
      3.1.3 AutoCAD 12 17
      3.1.4 Autoshade 2.0 and 3D Studio 17
      3.1.5 AutoDesk Animator Pro 18
   3.2 VersaCAD/386 18
   3.3 Lotus 1-2-3 2.x 20
   3.4 Symphony 2.x 21
   3.5 GEM Desktop 3.xx 22

3.6 Ventura Publisher 23
3.7 WordPerfect 23
3.7.1 WordPerfect 4.2 23
3.7.2 WordPerfect 5.1 24
3.8 Microsoft Word 5.0 25
3.9 Microsoft Windows 26
3.9.1 Microsoft Windows 386 26
3.9.2 Microsoft Windows 3.x 27
3.10 OS/2 Presentation Manager 2.0 28
3.11 Quattro Pro 29

1. Overview

This document is a reference for the Driver/Utility Installation Program. The program is offered in two versions: standard text installation method and new graphics oriented installation method (graphics windows, pull-down menus, etc.). The standard text installation is for those users who do not have a mouse, and who are more comfortable with using standard DOS commands. The new graphics oriented procedures are recommended for those individuals who have a mouse with their system, and who are more comfortable with a graphical menu driven interface. Keyboard commands can be used with the graphics oriented procedures, but will not be as efficient as compared to using the standard text installation procedures. The graphics procedures have been automated as much as possible to provide maximum user convenience.

To start the program, insert Driver & Utilities Diskette #1 into drive A. From drive A type: **README [Enter]**. Choose whether you would like the contents of the utility disk expanded to C:, D:, or E: drive. Be sure the destination hard drive has at least 3MB of memory available.

Once all files have been copied/expanded to the hard drive, the driver/utility program may be started by typing README from the TVGAUTIL directory on your selected hard drive. You will then be prompted as to whether you would like to use the standard text installation procedures or the new graphics installation procedures. If you choose standard text installation, you will be greeted by a main menu which lists all available utility/driver options. Choose the procedure you would like to perform (e.g. install AutoCAD drivers) and proceed. The program is menu driven and should require little additional explanation.

If you choose the new graphics oriented installation procedures you will be presented with a main menu screen as illustrated on the next page.

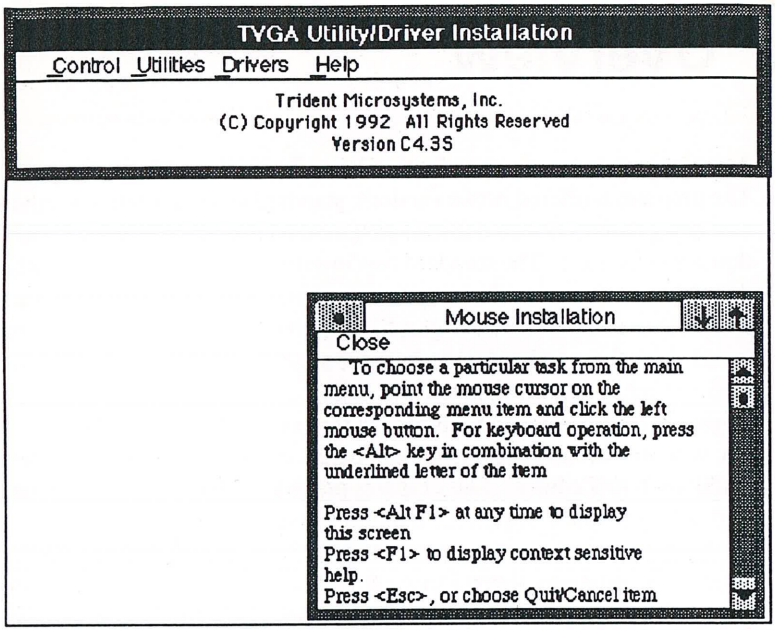

TVGA Utility/Driver Installation
Control Utilities Drivers Help
Trident Microsystems, Inc.
(C) Copyright 1992 All Rights Reserved
Version C4.3S
Mouse Installation
Close
To choose a particular task from the main menu, point the mouse cursor on the corresponding menu item and click the left mouse button. For keyboard operation, press the <Alt> key in combination with the underlined letter of the item
Press <Alt F1> at any time to display this screen
Press <F1> to display context sensitive help.
Press <Esc>, or choose Quit/Cancel item

Figure 1. Main Menu Screen

The main menu screen has an introductory dialogue window (selectable at any time by choosing **Help** from the Driver/Utility Installation Menu) which explains how to access help menus (press F1 or <alt>F1 for the main menu help), and how to operate the program from the keyboard. This window, as well as any other, may be moved by placing the mouse cursor at the window heading (the mouse cursor will become a hand) holding down the mouse button, and dragging the window to the desired location. Windows may also be re-sized by placing the mouse cursor across the window edge (the mouse cursor will become a bi-directional arrow), holding down the mouse button, and dragging the given edge to the location desired.

To select an item from the Driver/Utility Installation Menu, move the mouse cursor to the desired heading and click the mouse. There are four headings to choose from: **Control**, **Utilities**, **Drivers**, and **Help**. If you wish to install one or more of the utilities, select **Utilities**. If you wish to install a high-resolution driver (e.g. Windows, ACAD, etc.), select **Drivers**. To shell out to DOS select **Control** and then **DOS**. Once at the

DOS prompt, you may return to the Driver/Utility Installation program by typing "**Exit**". To exit the program, select **Control** and then **Exit**. For more information on available utilities, high resolution drivers, and their installation, reference Section 2 and Section 3 respectively.

2. Utilities Installation

2.1 Installation Procedures

After selecting **Utilities** from the Driver/Utility Installation Menu, you will be presented with a menu of possible utilities to install (Figure 2). Reference section 2.2 for a description of the utilities.

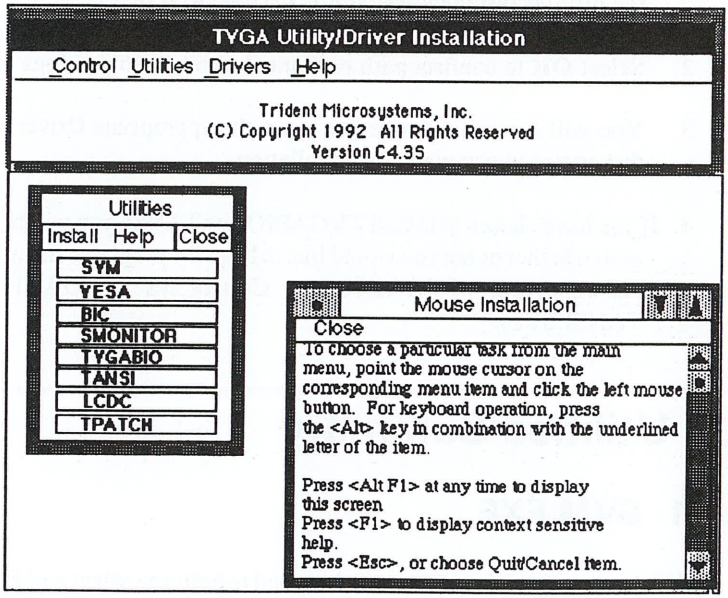

TYGA Utility/Driver Installation
Control Utilities Drivers Help
Trident Microsystems, Inc.
(C) Copyright 1992 All Rights Reserved
Version C4.35
Utilities
Install Help Close
SYM
VESA
BIC
SMONITOR
TYGABIO
TANSI
LCDC
TPATCH
Mouse Installation
Close
To choose a particular task from the main menu, point the mouse cursor on the corresponding menu item and click the left mouse button. For keyboard operation, press the <Alt> key in combination with the underlined letter of the item.
Press <Alt F1> at any time to display this screen
Press <F1> to display context sensitive help.
Press <Esc>, or choose Quit/Cancel item.

Figure 2. Utilities Menu Screen

To select all utilities at once, click the mouse on **Install** and choose to install **All** utilities. To select individual utilities, move the mouse cursor

to the given utility and click the mouse. You will be presented with a menu entitled Select/Run. Choose to install the given utility by clicking the mouse on **Select**. An asterisk will appear in front of the selected utility.
To learn more about the utility, select **About**. Certain utilities (BIC and SMONITOR) may be run directly from the Select/Run menu. Select **Run** to invoke the given utility. To unselect a utility, move the mouse to the utility with an asterisk and click the mouse. In the pop-up menu, click Unselect Option to unselect the utility. Once all desired utilities have been selected, you may begin installation by clicking the mouse on the Install menu and choosing to install the selected items.

Whether all utilities or just selected utilities have been chosen, perform the following to complete installation:

1. When prompted, indicate to which directory on your hard disk you want the utilities installed. Default is C:\TVGAUTIL.

2. Select **OK** to confirm path or **Cancel** to return to previous menu.

3. You will then be prompted to insert the appropriate Driver & Utilities diskette(s) to complete the installation.

4. If you have chosen to install TVGABIOS or TANSI, you will be prompted as to whether or not you would like to have the programs installed in your Autoexec.bat (TVGABIO) or Config.sys (TVGABIO.SYS or TANSI.SYS).

2.2 Utilities Summary

2.2.1 SVM.EXE

SVM is a menu-driven program designed to help you select and test all video modes available to the adapter. SVM allows you to emulate EGA, CGA, and Hercules (MDA) modes on a VGA monitor. This may be useful when you wish to run a special application (e.g. CGA PINBALL).

Some game programs require you boot up in CGA mode. For these programs, SVM will lock in CGA mode and will remain in CGA mode even if you warm-boot (press [Ctrl]-[Alt]-[Del]). For other modes (EGA, 1024x768-256,etc.), SVM will reset to VGA after you warm-boot. Since most standard programs run in VGA mode, do not forget to switch back to VGA mode before starting a standard application (e.g. Windows 3.x).

2.2.1.1 How To Use SVM

You can run SVM in either of two ways: by calling up the menu and selecting from the menu choices, or by entering the desired mode directly with a specific command line. This section covers both methods.

How To Use the SVM Menu

1. Go to the directory where you have installed SVM (e.g. C:\TVGAUTIL).

2. Type:

   SVM [Enter]

3. The SVM menu will display the available modes. Use the arrow keys to select the mode you want. Press [Enter] to select the mode. You may preview your selection by pressing F5.

How to Use SVM Through Command Lines

If you already know what mode you want to select, and you do not want to use the SVM menu, you can type:

SVM [Selected Mode] [Enter]

Table 1. shows the some values you can enter in the command line. You may also reference the mode specification table at the bottom of the SVM menu screen.

TABLE 1. SVM Command Lines

Desired Mode/Feature	Command Line
Switch back to regular VGA 80x25	SVM VGA
Switch to EGA mode	SVM EGA
CGA for game programs that run under DOS	SVM CGA
CGA for stand-alone game programs (those which have to boot from their own diskettes)	SVM CGA BOOT
Hercules monochrome	SVM HERC
80 columns by 30 rows text mode	SVM 80x30
80 columns by 43 rows text mode	SVM 80x43
132 columns by 25 rows text mode	SVM 132x25
132 columns by 43 rows text mode	SVM 132x43
132 columns by 60 rows text mode	SVM 132x60
1024x768-256 color graphics mode	SVM 1024x768-256 NI
640x480-32K color graphics mode	SVM 640x480-HiC

2.2.1.2 Example: Switching to EGA Mode with SVM

1. Go to the directory on your hard disk where you have installed SVM. Type:

   SVM [Enter]

2. Use the **Arrow Keys** on your keyboard's numeric keypad to select EGA, and press the **[Enter]** key to confirm your choice.

   You can also switch to EGA mode directly. At the DOS prompt, type:

   SVM EGA [Enter]

3. To return to VGA mode from EGA mode, type:

   SVM VGA [Enter]

2.2.2 VESA

The VESA BIOS extension is a Terminate and Stay Resident Program (TSR) which acts as an extension to the video BIOS. To run this program type VESA or VESA-F (VESA-F skips inquiry as to whether you wish to add or remove the BIOS extension from system RAM). The VESA BIOS extension will allow users to install and run the VESA drivers supplied with a variety of applications (e.g. AutoCAD 12, Deluxe Paint II Enhanced, Generic CAD Level III or 5.0, Microstation PC v. 4.0, Cadkey 4.0, AutoDesk Animator Pro, etc.).

2.2.3 BIC

Reports PC system BIOS date, and video BIOS date and version number. This utility is useful if you are not sure if the system BIOS supports VGA. If your PC ROM BIOS date is earlier than October 27, 1982, you will need to replace your system ROM BIOS to support the VGA adapter.

2.2.4 SMONITOR

Switches between color and monochrome display. Some monitors (most notably Samsung monitors manufactured before 2/8/91) do not adhere to the standard IBM pinout definitions, which causes the VGA card to boot up in monochrome instead of color. This utility may be used to correct the problem. To run, add following command to your Autoexec.bat file **SMONITOR C**.

To run from the DOS prompt, just type **SMONITOR** from the directory where you have installed the utilities.

2.2.5 TVGABIO

TVGA RAM BIOS enables you to keep the video BIOS in your system's active memory for faster display response. It requires approximately 32K of memory. If your system has enough memory, you may want to try using the TVGA RAM BIOS. For the CONFIG.SYS file, use TVGABIO.SYS; for the AUTOEXEC.BAT file, use TVGABIO.EXE. On an 8-bit system, TVGA RAM BIOS will make your display run faster; on a 16-bit system, increased speed will depend on your system's hardware limitations.

2.2.6 TANSI.SYS

TANSI.SYS provides an enhanced ANSI driver for your standard output device. This driver allows you to display more than 25 rows of text on your standard screen. If you already have an ANSI driver installed and are unable to display more than 25 rows of text, you might want to replace your ANSI driver with TANSI SYS.

2.2.7 TVGACRTC

The TVGACRTC program allows you to adjust video display parameters so that images will be optimally sized and centered on the screen. Adjustable parameters include horizontal size and position, vertical size and position, and pixel frequency. A list of monitors with pre-programmed CRTC parameters is provided. If your monitor is not listed, you will need to create your own entry.

The program also allows you to configure the adapter's decode method (Fast or Slow Address Decode) and BIOS and Video I/O data width (8 or 16-bit). These configuration settings override the hardware jumper settings.

To start the program from the DOS prompt, just type TVGACRTC from the C:\TVGAUTIL\UTILITY directory on your hard drive. To access the configuration screen, press F10 from the main TVGACRTC menu screen.

2.2.8 LCDC

LCDC is designed for notebook, etc. type systems with Liquid Crystal Display (LCD) panels. If you have such a system, you will be provided with an LCDC User Guide which explains the LCDC utility in more detail.

NOTE: This utility is not useful for desktop systems with monitor display.

2.2.9 TPATCH

The TPATCH provides several patch files to correct screen display problems. TPATCH corrects the display problems for the Print Preview function of WordPerfect 5.1, File Import/Export function of Applause 1.5, IBM 3270 Emulation, Grasp 4.0, PICEM 1.0, Windows 3.1 SKD, and EZ-Menu. To run, just type TPATCH at the DOS prompt. The TPATCH displays a list of patch files. Just select the patch you need and provide the directory of your application software. TPATCH will modify the display driver provided by your application software.

3.0 Driver Installation

After selecting **Drivers** from the Main Menu, you will be presented with a menu of possible drivers to install (see Figure 3). To select one, move the mouse cursor to the given driver and click the mouse. You will be presented with a Version Menu for the given application. Choose the appropriate version of the application. Once a driver has been installed, a check mark will appear before the given application. Driver installation details follow.

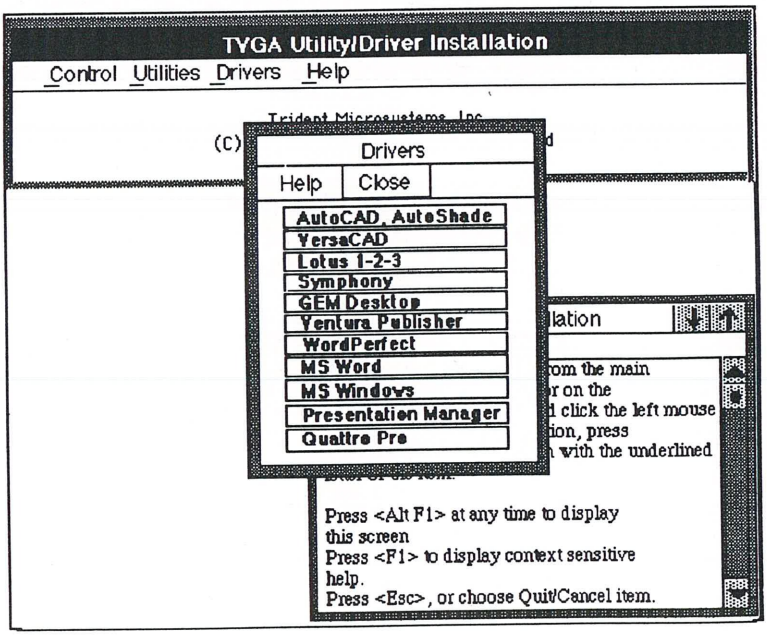


Figure 3. Drivers Menu Screen

3.1 AutoCAD, Autoshade

3.1.1 AutoCAD Release 9 and 10 (ADI Driver)

1. You will be prompted if you wish to install drivers for both AutoCAD and Autoshade, or just AutoCAD. If you choose to install both AutoCAD and Autoshade, please refer to section 3.1.1.1 after completing the installation procedures in section 3.1.1.

2. Select the version of AutoCAD you have installed on your hard drive. When you select a version of AutoCAD, the program will prompt you for the directory to which you want to load the drivers. C:\ACAD is the default directory. Enter the directory you plan to use if it is different from the default directory.

TABLE 2. ADI Drivers on the Driver & Utility Diskettes

ADI Version[1]	Resolution/ Colour	Monitor Options	DRAM Required
ADI V3.x/V4.x	800x600-16	Single/dual	256K
ADI V3.x/V4.x	1024x768-16	Single/dual	512K
ADI V3.x/V4.x	640x480-256	Single/dual	512K
ADI V3.x/V4.x	800x600-256	Single/dual	512K
ADI V3.x/V4.x	1024x768-256	Single/dual	1MB

[1] Same driver used for ADI V3.X and ADI V4.X

3. Select a display driver from the menu. When you select a driver, the correct files will load automatically into your AutoCAD directory. If you are not installing an Autoshade driver, please skip to step 5.

4. If you have chosen to install AutoCAD and Autoshade, you will be prompted to select a Rendering Device Driver for Autoshade. Your options are 640x480-256 colors, 800x600-256 colors (512K DRAM required) or 1024x768-256 colors (1MB DRAM required). When you select a driver, the correct files will automatically load into your Autoshade directory.

5. Enter the ADI interrupt vector you wish to use. The default value is 7A. If you are using a system with a LAN network card installed (e.g. Novell), you may need to select an interrupt value other than the default value (i.e. 7B, 7C, 7D). If so, be sure to use the same interrupt value for all AutoDesk programs (AutoCAD, AutoShade, etc.)

6. Select Normal or Black background. For details on background color, please reference **Special Options for Releases 9 and 10** below.

7. Select Dual Screen or Single Screen mode (Y-Dual Screen mode, N-Single Screen mode). For details on dual-screen or single-screen modes, please reference **Special Options for Releases 9 and 10** below.

8. The remaining steps need to be completed inside AutoCAD. They are listed in a text window. You may note them down or reference steps 9 through 11.

9. Exit the Driver/Utility Installation program.

10. Start AutoCAD and bring up the configure AutoCAD menu. Reconfigure the video display by selecting ADI display Vx.x.

11. To load the driver: exit AutoCAD, reboot your system, and enter DSVGA on the command line. When you start AutoCAD, the graphics display will be at the resolution you selected.

NOTE: Please consult your AutoCAD Users Guide for additional information on driver installation.

Special Options for Releases 9 and 10

Dual Monitor Support

The drivers for Releases 9 and 10 offer special options. In your Auto-CAD manual, you will notice that AutoCAD offers support for both single and dual monitors. For the dual monitor feature, use a monochrome card and monitor in combination with your VGA adapter and graphics monitor. In this mode, AutoCAD displays text menu information on the monochrome monitor and the drawing on the graphics monitor. In the standard configuration, use a function key to flip between the text and graphics screens.

Background Color

The AutoCAD drivers will support both white and black backgrounds on the graphics screen. Entering DSVGA initializes the background selected during the installation procedure.

3.1.1.1 Autoshade 1.1

The Autoshade driver is installed along with an AutoCAD ADI driver. You will, however, need to configure the Autoshade program for the newly installed Autoshade Driver. This may be accomplished as follows:

1. From DOS, enter the directory where Autoshade is stored (i.e. C:\SHADE). Type:

   SHADE ; if you are configuring Autoshade for the first time, or

   SHADE -R ; if you have previously configured Autoshade.

2. Configure Autoshade as follows:

   a. Select **Option 1** (Autodesk Interface Display Driver) for the Interactive Display Device, and **Option 1** (Autodesk Interface Rendering Driver) for the Rendering Display Device.

   b. Enter "**Y**" for "Do the display and rendering devices share a single screen?" and "Does the FLIPSCREEN require a redraw?"

3. To use the Autoshade driver along with AutoCAD/386 protected mode drivers, type **DSVGAR -F** before entering Autoshade. This switch will install only the Autoshade rendering driver and not the AutoCAD ADI driver.

3.1.2 AutoCAD/386 Release 10 and 11 (PDI Driver)

1. You will be prompted to give the location of the AutoCAD directory

on your hard disk (e.g. C:\ACAD386). Enter the path and then select OK. The display drivers (RCPTVGA.EXP) will be automatically copied to your AutoCAD/386 directory (e.g. C:\ACAD386).

2. The command SET DSPADI = RCPTVGA must now be added to your Autoexec.bat file. Enter "**1**" to have the Driver/Utility Installation program modify Autoexec.bat for you; or enter "0" to modify the Autoexec.bat file yourself.

3. The remaining steps need to be completed inside AutoCAD. They are listed in a text window. You may note them down or reference steps 5 through 8.

4. Choose to run ACAD.EXE by entering "**Y**" in response to the prompt. The installation program will then exit to AutoCAD's main menu.

5. Select in order, **Configure AutoCAD**, **Configure Video Display** and **ADI P386 Display**.

6. Choose one of the graphics drivers.

7. A number of prompts follow which allow you to select the graphics area background color, text color (for the menu, status line, and command prompt areas of the screen), text background color, border color, and dialogue box/button outline color. To select the default colors, press [Return] at each prompt. To select a different color, enter the appropriate color number at the given prompt.

NOTE: For 16-color modes, you can only select black or white for graphics background color.

The color numbering scheme for 16-color modes (15 colors plus black) is:

1 - Red
2 - Yellow
3 - Green
4 - Cyan
5 - Blue
6 - Magenta
7 - White
8 - Dark grey
9 - Low intensity red
10 - Low intensity yellow
11 - Low intensity green
12 - Low intensity cyan
13 - Low intensity blue
14 - Low intensity magenta
15 - Light grey

The color numbering scheme for 256 color modes matches that defined in the AutoCAD/386 Installation and Performance Guide for IBM's 8514 Adapter.

Refer to the IBM Video Graphics Array Video Display Option in Autodesk's Installation and Performance Guide for more detailed information on the color select prompts for 16 color and 256 color modes.

8. You have completed the driver installation for AutoCAD/386. If you need to reconfigure for a different resolution, repeat steps 5 through 7, then run AutoCAD as usual.

3.1.3 AutoCAD 12

AutoCAD release 12 supports VESA (Video Electronic Standard Associate) driver. If your adaptor is equipped with a VGA BIOS that is version C3.0 or later, you can just select VESA driver from the ACAD Configuration Option. If your VGA card is equipped with an earlier version of BIOS, you can load a TSR program called VESA.EXE prior to executing ACAD 12 and select VESA driver from the ACAD Configuration Option.

3.1.4 Autoshade 2.0 and 3D Studio

1. You will be prompted to give the location of the application on your hard disk (e.g. C:\SHADE). Enter the path and then select OK. The display drivers (RCPTVGA.EXP) will be automatically copied to the specified location.

2. For Autoshade 2.0 the following set commands must be added to your Autoexec.bat file:

```
SET DSPADI = RCPTVGA
SET RDPADI = RCPTVGA
```

For 3D Studio the following set command must be added:

```
SET RCPADI = (3D Studio Directory)\RCPTVGA.EXP
```

When prompted, enter "**2**" to have the Installation Program load the set commands for Autoshade to your Autoexec.bat file, "**1**" to have the program load the set command for 3D Studio to your Autoexec.bat file, or "**0**" to modify the Autoexec.bat file yourself.

4. Consult your Autoshade 2.0 and 3D Studio manuals for additional information on how to configure these programs for high resolution drivers.

3.1.5 AutoDesk Animator Pro

AutoDesk Animator Pro supports VESA (Video Electronic Standard Associate) driver. If your adaptor is equipped with a VGA BIOS that is version C3.0 or later, you can select VESA driver from the Animator Pro video configuration option. If your VGA card is equipped with an earlier version of BIOS, you can load a TSR program called VESA.EXE prior to executing Animator Pro and VESA driver from the Animator Pro video configuration option.

3.2 VersaCAD/386

1. You will be prompted to give the location of the VersaCAD directory on your hard disk (e.g. C:\VCAD386). Enter the path and then select OK. The display drivers (TV16P.EXE and TV256P.EXE) will be automatically copied to the VersaCAD directory.

   TV16P.EXE denotes the 16 color graphics screen driver. This driver includes 800x600 and 1024x768 resolutions. **TV256P.EXE** denotes the 256 color graphics screen driver. This driver includes 640x480, 800x600, and 1024x768 resolutions.

2. Choose to run TV16P.EXE if you want to select a 16-color driver or TV256P.EXE if you want to select a 256 color driver (enter "**Y**" in response to the prompt).

3. The remaining steps need to be completed inside VersaCAD. They are listed in a text window. You may note them down or reference steps 4 through 8.

4. Choose to run CONFIG.EXE by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to the CONFIG main menu.

NOTE: When changing from a 16 color driver to a 256 color driver, or visa versa, complete steps 4 through 8; then exit VersaCAD and reboot your system. Run the appropriate *COM*/EXE file and then strat VersaCAD.

5. Enter the **Environment Configuration Program** by pressing "**E**".

6. Press, in order, "**N**" to select **Environment Menu3** and "**S**" to select **Screen Configuration**.

7. Select a display driver.

8. Continue with the rest of the Environment Configuration Program.

3.3 Lotus 1-2-3 2.x

1. You will be prompted to give the location of the Lotus directory on your hard disk (e.g. C:\LOTUS). Enter the path and then select OK. The display drivers (SET123) will be automatically copied to the Lotus directory.

2. The remaining steps need to be completed inside Lotus. They are listed in a text window. You may note them down or reference steps 4 through 9.

3. Choose to run LOTUS.COM by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to the Lotus Access System Menu.

4. Select **Install** from the main menu.

5. Select **Advanced options** from the Install menu.

6. Select **Add new driver to library** from the Advanced Options menu.

7. Select **Modify current driver set** from the menu.

8. Select either **text** or **graphics** display. For the text mode, choose one of the following command lines to indicate the number of rows for your display:

   TVGA 132x25 Version x.x
   TVGA 132x30 Version x.x
   TVGA 132x43 Version x.x
   TVGA 132x60 Version x.x
   TVGA 80x30 Version x.x
   TVGA 80x43 Version x.x
   TVGA 80x60 Version x.x

   (Example: enter TVGA 132x25 Version 1.0 for 132 column by 25 row display. You can enter any of the following values for rows: 25, 30, 43, or 60).

   For graphics mode, select the following command line:
   TVGA 640x480 for Release 2.x

9. Return to the Lotus 1-2-3 main menu and choose **Save Change** to record the changes you have made, then exit the Lotus 1-2-3 installation program.

10. You have completed driver installation for Lotus 1-2-3. If you need to reconfigure for a different resolution (i.e., 132x25 to 132x30 in text mode), just follow steps 4 through 9, then run Lotus 1-2-3 as usual.

3.4 Symphony 2.x

1. You will be prompted to give the location of the Symphony directory on your hard disk (e.g. C:\SYMPHONY). Enter the path and then select OK. The display drivers (SETSYMPH) will be automatically copied to the Symphony directory.

2. The remaining steps need to be completed inside Symphony. They are listed in a text window. You may note them down or reference steps 4 through 9.

3. Choose to run SYMPHONY.COM by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to the Symphony Access System Menu.

4. Select **Install** from the main menu.

5. Select **Advanced options** from the Install menu.

6. Select **Add New Driver To Library** from Advanced Options menu.

7. Select **Modify Current Driver Set** from the menu.

8. Select either **text** or **graphics** display. For the text mode, choose one of the following command lines to indicate the number of rows for your display:

TVGA 132x25 Version x.x
TVGA 132x30 Version x.x
TVGA 132x43 Version x.x
TVGA 132x60 Version x.x

TVGA 80x30 Version x.x
TVGA 80x43 Version x.x
TVGA 80x60 Version x.x

(Example: enter TVGA 132x25 Version 1.0 for 132-column by 25-row display. You can enter any of the following values for rows: 25, 30, 43, or 60).

For graphics mode, select the following command line:

TVGA 640x480 for Release 2.x

9. Return to the Symphony main menu and choose **Save Changes** to record the changes you have made, then exit the Symphony installation program.

10. You have completed driver installation for Symphony. If you need to reconfigure for a different resolution, (i.e. 132x25 to 132x30 in text mode), follow Steps 4 through 9, then run Symphony as usual.

3.5 GEM Desktop 3.xx

1. You will be prompted to prepare a GEM/3 driver diskette. The installation program will copy driver files to the newly formatted diskette in drive A.

2. The remaining steps need to be completed inside GEM. They are listed in a text window. You may note them down or reference steps 3 through 7.

3. Choose to run the GEMSETUP program by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to GEMSETUP's Main Menu.

4. Select in order: **Change Existing Configuration, Continue, Change Your Current Setup,** and the listed graphics and card display.

5. When you are prompted to choose a new graphics card and display, select **Other Pack** and insert the newly prepared GEM/3 driver diskette in drive A.

6. Select a display driver.

7. Continue with the rest of the GEMSETUP program. Please consult your GEM manual for more info on the GEMSETUP program.

3.6 Ventura Publisher

1. You will be prompted to prepare a Ventura driver diskette. The installation program will copy driver files to the newly formatted diskette in drive A.

2. You will be asked to give tha location of the Ventura directory on your hard disk (e.g. C:\VP). Enter the path and then select OK.

3. Indicate whether or not you are using the Ventura Publisher Professional Extension.

4. Select one of the display modes listed.

5. Indicate the type of mouse you are using and, if necessary, to which I/O port (i.e. COM1, COM2, etc.) the mouse is connected.

6. Confirm your choices to complete the installation.

If you want to reconfigure for a different display mode, you will need to repeat this entire installation procedure.

3.7 WordPerfect

3.7.1 WordPerfect 4.2 (extended text mode drivers only)

1. You will be prompted to give the location of the WordPerfect directory on your hard disk (e.g. C:\WP). Enter the path and then select OK.

2. The remaining steps need to be completed inside WordPerfect. They are listed in a text window. You may note them down or reference steps 3 through 6.

3. Choose to run WP/S by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to the WordPerfect Setup Menu.

4. Select option 3, **Set Screen and Beep options**.

5. Enter the values for **column** and **row** to match a column/row value available in SVM.EXE.

6. Choose option 0 to accept the new configuration and enter WordPerfect.

7. You have completed driver installation for WordPerfect 4.2. If you need to reconfigure for a different resolution, (i.e. 132x25 to 132x30 in text mode), just repeat steps 1 through 5.

When starting WordPerfect *in an extended text mode, follow these steps:*

1. Run the SVM.EXE program to select the extended text mode you want to use (i.e., 132 or 80 columns by 25, 30, 43, or 60 rows).

2. Start WordPerfect.

3.7.2 WordPerfect 5.1

To install the text mode drivers

1. You will be prompted to give the location of the WordPerfect directory on your hard disk (e.g. C:\WP). Enter the path and then select OK. The display drivers (TVGATEXT.VRS) will be automatically copied to the WordPerfect directory.

2. The remaining steps need to be completed inside WordPerfect. They are listed in a text window. You may note them down or reference steps 3 through 5.

3. Choose to run WP.EXE by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to WordPerfect.

4. Press **Shift-F1** to bring up the Setup Menu. Press "**2**" to select **Display** and then "**3**" to select **Text Screen Type**.

5. Choose one of the extended text drivers. The available drivers are 80x30, 80x43, 80x60, 132x30, 132x43, 132x60.
6. You have completed driver installation for WordPerfect. If you need to reconfigure for a different resolution, (i.e. 132x25 to 132x30 in text mode), just repeat steps 4 and 5.

To install extended graphics mode drivers

1. You will be prompted to give the location of the WordPerfect directory on your hard disk (e.g. C:\WP). Enter the path and then select OK. The display drivers (TVGA16.VRS) will be automatically copied to the WordPerfect directory.

2. The remaining steps need to be completed inside WordPerfect. They are listed in a text window. You may note them down or reference steps 3 through 5.

3. Choose to run WP.EXE by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to WordPerfect.

4. Press the **Shift-F1** to bring up the Setup Menu. Press "**2**" to select Display and the "**2**" to select **Graphics Screen Type**.

5. Choose one of the Extended Graphic drivers. The available drivers are 800x600-16 colors, 1024x768-16 colors, and 768x1024-16 colors.

6. You have completed driver installation for WordPerfect. If you need to reconfigure for a different resolution, (i.e. 800x600), just repeat steps 4 and 5.

3.8 Microsoft Word 5.0

1. You will be prompted to give the location of the MS Word directory on your hard disk (e.g. C:\WORD). Enter the path and then select OK. The display drivers (SCREEN.VID) will be automatically copied to the Word directory.

2. The remaining steps need to be completed inside MS Word. They are listed in a text window. You may note them down or reference steps 3 through 5.
3. Choose to run WORD.EXE by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to Word

4. Press **ESC** to enter a command. Press "**O**" to enter an Option Command.

5. Select **Display Mode**, then press **F1** to list the display modes available. Choose one of the following lines to indicate the number of rows for your display:

(1) Text, 25 lines, 16 color
(2) Text, 43 lines, 16 color
(3) Text, 50 lines, 16 color
(4) Text, 60 lines, 16 color
(5) Text, 25 lines, 16 color[1]
(6) Text, 30 lines, 16 color[1]
(7) Text, 43 lines, 16 color[1]
(8) Text, 60 lines, 16 color[1]

[1] Lines 5 through 8 are for 132 column modes. Mouse support is not available for 132 column modes.

6. You have completed driver installation for MS Word. If you need to reconfigure for a different resolution, (i.e.132x25), just repeat steps 4 and 5.

3.9 Microsoft Windows

3.9.1 Microsoft Windows 386

1. You will be prompted to place the Windows SETUP diskette in drive A. Type SETUP to start the SETUP program.

2. Follow the instructions on the screen for the SETUP program. When you are prompted to choose the display adaptor, select the option **Other** to use the supplied driver for TVGA, and insert Driver and Utility disk (optional diskette - available upon request) in drive A.

3. Select one of the high-resolution graphics modes listed.

4. Select Medium System Font (VGA)

5. Continue with the rest of the MS Windows' SETUP program. You have completed the MS Windows high-resolution driver installation. If you need to reconfigure for a different display mode, you will need to repeat the above installation procedure.

3.9.1 Microsoft Windows 3.x

1. It will be assumed at this point that you have already installed Microsoft Windows 3.x using the standard IBM VGA driver and that it is working with no problems. If haven't installed Windows 3.x, exit the Installation Program and complete the Microsoft Windows installation.

2. Exit the Windows program and change the directory to your Windows 3.x directory (e.g. C:\Windows), and run SETUP.EXE.

3. Move the cursor to the "Display" section in the System Information and hit **[Enter]**. You will be asked to select a Display from a list. Move the cursor to the "Other" option.

4. Insert the TVGA Driver/Utility Disk, specify the A:\WIN directory in the Windows setup menu, and select a suitable Trident driver.

5. Follow instructions to finish SETUP.

NOTE: For Network installation or upgrade from our previous Windows drivers, please refer to the README.TXT in the \WIN subdirectory of TVGA Driver/Utility diskette for detail information.

3.10 OS/2 Presentation Manager 2.0

1. To install the TVGA driver for OS/2 2.0 Presentation Manager, you will need the Optional TVGA OS/2 2.0 Drive Disk. To obtain this disk, contact Trident Microsystems, Inc. or your dealer.

2. It will be assumed at this point that you have already installed OS/2 2.0 with an adaptor based on a Trident VGA chip. If you previously have installed OS/2 2.0 with a card based on another vendor's chip, the reinstallation of OS/2 2.0 is highly recommended. Assume the startup driver is C:

3. Make a backup copy of the following OS/2 drivers:
   C:\OS2\DLL\DISPLAY.DLL
   (PM Display driver)
   C:\OS2\MDOS\WINOS2\SYSTEM\VGA.DRV
   (WIN OS2 full screen driver)
   C:\OS2\MDOS\WINOS2\SYSTEM\SWINVGA.DRV
   (WINOS2 seamless driver)

   We recommend that you put the backup files on a floppy diskette.

4. Go to a DOS full screen session, run system command **SVGA ON.** A file called SVGADATA.PMI will be generated in C:\OS2. Save this file on a floppy diskette.

5. Switch to OS/2 protected mode session and start **DDINSTAL.**

6. Follow the instructions to finish the rest of the procedures.

7. You will need to shut down and reboot the system before the driver takes effect.

8. Please refer to README.OS2 in OS/2 2.0 Installation Disk for OS/2 2.0 Virtual Desktop Display drivers installation procedures and other details.

3.11 Quattro Pro

1. You will be prompted to give the location of the Quattro Pro directory on your hard disk (e.g. C:\QPRO). Enter the path and then select OK. The display drivers (VIDEO.RSC) will be automatically copied to the Quattro Pro directory.

2. The remaining steps need to be completed inside Quattro Pro. They are listed in a text window. You may note them down or reference steps 3 through 5.

3. Choose to run Q.EXE by entering "**Y**" in response to the prompt. The Driver/Utility Installation program will then exit to Quattro Pro.

4. Press "**/O**" to select the **Options** menu and "**D**" to select Display Mode.

5. Choose an extended text mode.

6. You have completed the graphic driver installation for Quattro Pro. If you need to reconfigure for a different resolution, (i.e. 800x600), just repeat steps 4 and 5.